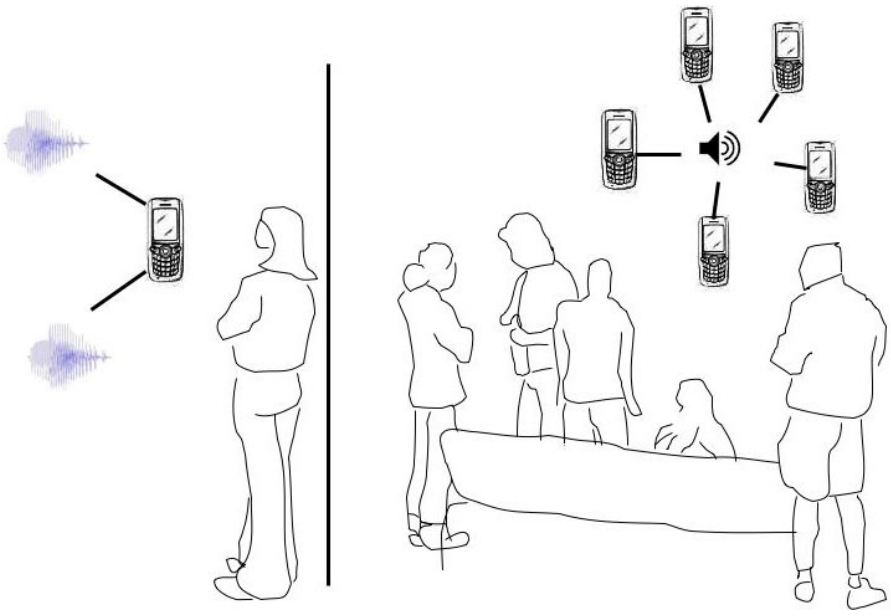
IMPROVe

Exploring modes of listening



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Abstract:

In my thesis I explore how listening is shaped by the noise and sound reproduction machines of modernity to understand how this has influenced our environmental sonic awareness. I present a positive viewpoint of my experiences from working with sound, music and technology. From this viewpoint I introduce IMPROVe which is a concept for listening to, recording and improvising with the sounds from everyday life. The practical implementation of this concept includes the experimental use of mobile phones for engaging with the sonic environment. I developed a working prototype using the mobile phone and the computer to enhance the activities in the IMPROVe concept. It has been used in workshops and performances where the idea has been to work with site-specific sounds to promote the attentive and critical listening to the environment by the participants.

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Introduction

IMPROVe is a concept for engaging in activities around the sounds of everyday life. It involves listening to, recording and making music with those sounds. The concept includes custom made software for mobile phones and computers for some of it's activities.

IMPROVe is a collaborative master thesis project between myself and Zeenath Hasan and has been activated in several festivals, workshops and performances. The workflow in this project has most often started with practical explorations which then has lead into more conceptual and theoretical thoughts.

In this thesis I elaborate upon the different modes of listening that the IMPROVe activities initiate. As a background for this elaboration I use my own experiences as a sound artist and musician, theoretical work and the experience of IMPROVe in different contexts and locations. To relate the practice of IMPROVe with my own trajectory in this field has been very rewarding for me and I think that I have brought forth some valuable questions and possible answers.

The different parts of the thesis have different approaches and points of view to the work of IMPROVe. This should be considered while reading the thesis.

Chapter one is written together with Zeenath Hasan. It is an introduction to IMPROVe as a collaborative work. Since we wrote the chapter together, the "voice" of it differs from the rest of this thesis.

Chapter two clarifies the concept and explains how to engage in the process of IMPROVe as a tool for gathering sounds and how to improvise with them. This chapter also contains the questions that I have been working with in the frame of this thesis.

Chapter three deals with theory and issues from my background as a practitioner related to the questions that IMPROVe raises.

Chapter four contains summaries of the practical experiences we have had with IMPROVe in different contexts.

Chapter five describes the technological system developed for IMPROVe.

Chapter six discusses future possibilities and developments of IMPROVe.

There are sound examples and video footage referred to in the thesis which are crucial for the understanding of my discussion. Please access the sounds and video clips on the

enclosed cd, if there is one, or online at: http://www.riwid.net/improve/modes

The code for the mobile phone and computer application is also included on the cd. It will be released later on the above url.

The enclosed cd is a hybrid audio/data cd which means that the audio tracks works in a normal audio cd player and the video clips and code can be accessed from a computer.

1 IMPROVe as a collaborative design project

This document is co-authored by Zeenath Hasan and Richard Widerberg as an introduction to their group masters thesis project called IMPROVe. It offers the prerequisite reading that introduces their collaboration and situates their individual theses in the joint project.

Background

Richard Widerberg and Zeenath Hasan initiated IMPROVe as their masters thesis project in August 2005 at the Media Lab of the University of Art and Design Helsinki. The motivation for their collaboration was the opportunity to create an open platform that enables an awareness of the environment. IMPROVe is a collective attempt to create conditions for a heightened perception of the lived sonic environment with the help of mobile phones.

Listening with mobile phones

The word 'IMPROVe' in the title ofthe project is a combination of the words 'improvisation' and 'improvement'. Improvisation is the act of making up something as you go along. Improvement is the act or process of enhancement. The IMPROVe project is a critical step away from the prevalent notion of the mobile phone as a personal communication device to that of a medium for environment awareness through the engaging activities of collection of and improvisation with sounds. Zeenath elaborates on the above notions in her thesis paper.

Description of the working prototype

Sound samples are collected via a digital recording device and transferred to a computer. A graphical user interface running in Python on a Nokia Series 60 phone controls the playback of the collected soundsamples in a Puredata realtime sound processing patch on the computer. The control is wireless via bluetooth. The sounds are looped by default and the realtime processing parameters are volume, playback speed and loop length. The processed sounds are played back via a sound system connected to the computer. Several mobile phones are connected to the same computer and they control one sound each. The sounds are played back at the same time which makes group improvisation possible.

In its ideal conception, the activities associated with IMPROVe should take place only on

the mobile phone without the need of a computer. But because of hardware and software limitations with recording quality and realtime processing of sound on mobile phones, the implementation of a standalone version of IMPROVe has been pushed to the future. The working prototype was developed by Richard.

Engaging with IMPROVe

Engagement with IMPROVe involves performing a certain set of activities. Richard employs his personal sound art practice to focus on the activities in IMPROVe. He discusses the activities of listening, recording and improvising and the way they affect how we listen to the world around us. He presents in his thesis how modernity has changed our listening due to a noisier environment and the possibility to reproduce our sonic surroundings. Also on how different ways to treat recorded sounds alters our listening to reality. He uses both his own experience as a soundartist and musician and the experience with IMPROVe when discussing those issues.

The modes of activity when engaging with IMPROVe are listening, recording, processing, sharing and improvising. In the following, these are presented as short instructions to the people who practice IMPROVe-ment.

Listening & Recording

Listen carefully to your environment and record sounds and spaces you find interesting. The act of recording sounds enhances the attentive listening of the environment as one has to find and select sounds to record.

Transforming Sounds

The sounds you have recorded will appear different when you play them back since they are captured with a recording medium. Select the sounds you find most interesting.

Improvising and Performing

Gather your selected sounds together and make them all available in the IMPROVe software. Now it is time to start to improvise with the sounds. The improvisation session can be performed by yourself alone or with a group of people.

Post-Process

Now that you have used your's and other's recorded sounds in an improvised composition think again about the moment when you recorded your sounds. Has the process of recording, choosing and editing sounds and finally playing with them changed how you listen to your recorded sounds? How did you listen to other's sounds in the session? As field recordings, music or noise? And how do you listen to the world around you after an

IMPROVe session?

Co-initiating IMPROVe

For Richard IMPROVe is a concept which includes a workshop model for listening, recording, processing, sharing and improvising with sound. The developed software used on mobile phone and computer in the workshop is also part of the IMPROVe concept. So when referring to IMPROVe it includes both the workshop model and the software for Richard. With his background as a soundartist and musician Richard has worked closely with the sound-related activities around listening, recording and improvising in the IMPROVe framework.

Zeenath is a media practitioner interested in mobilizing media technologies to facilitate grassroots activities and networks. In her works, she attempts to exercise the artistic potential of normative media practices. For Zeenath, IMPROVe is an artefact. Perceiving it as such allows for a revealing view into the associations that contribute to the evolution of the IMPROVe concept. In other words, the concept evolves from the collective inputs of individuals and groups. With her background as a media designer/ researcher, Zeenath set into pace a collaborative design process for the evolution of IMPROVe. She periodically invited prospective stakeholders to share their expectations from IMPROVe. The collated viewpoints have impacted on her understanding of the artefact being created and has made explicit to her some of her design intuitions.

Relevance of IMPROVe

The mutually shared motivation of Zeenath and Richard to explore the social, cultural and aesthetic significance of media provided them the impetus for initiating a joint masters thesis project. Their decision to adopt a collaborative design process and to develop a working prototype with open source software prompted them to introduce IMPROVe in various formats at different fora with diverse groups of practitioners. These fora are listed in the final section of this document, called 'IMPROVe footprints'. Presentations and discussions of IMPROVe at the listed fora saw IMPROVe emerge as a performance tool in public space; a hands on approach to understanding media; presentations in media technology, design and art symposiums; a media art installation; and as environmental sound workshops.

Interactions with media, art, design and technology practitioners have lead to the emergence of future prospects for IMPROVe as a tool for the collective creation of content for entertainment (in collaboration with a television production house); as a tool for better governance (in collaboration with a grassroots network developing open source and free software for civil society); and continuation as workshops on the soundscape of

different places and in different contexts.

The decision to apply IMPROVe in various contexts was taken mutually by Richard and Zeenath based on their individual and collective interests. This open approach has aided in their understanding of the relevance of IMPROVe in society. The duo continue to work on the project.

IMPROVe footprints

The joint masters thesis project appreciates the financial backing of a project grant from UIAH and travel grants from the Finnish Arts Council, which has facilitated its presentation in the following fora:

A. As a performance tool in public space,

i) Culmination of a weeklong locative media workshop with interested members of the public at the Helsinki Central Railway Station during the Pixelache Festival of Electronic Arts and Subcultures, Helsinki, April 2006

ii) Culmination of a weeklong workshop involving listening to the sounds of the city with Asian and European students of media at Gallery Myymälä2, Helsinki, May 2006

iii) Performance by electronic musicians with sounds of Zurich city at Cabaret Voltaire, Zurich, July 2006

iv) Performance with sounds of Manchester industrial area by visitors to the Futuresonic Urban Festival of Electronic Music and Arts, Manchester, July 2006

v) Performance by the interested public at the Grand Cafe zum Rothen Krebsen during the Ars Electronica Festival, Linz, August 2006

B. As a hands on approach to understanding media in workshops with,

i) Media artists and mobile phone application designers at the Mobile Music workshop, University of Sussex, Brighton, March 2006

ii) Swedish radio broadcasting industry professionals at the Experimental Radio Production workshop, K3, Malmö, December 2006

iii) Nordic and Turkish activist artist networks at the Peer to Peer workshop, K2 Art Center, Izmir, February 2007

C. As presentations in media technology, design and art symposiums at,

i) Digital Art Weeks Symposium, ETH University, Zurich, July 2006

ii) Nordic Summer University, session on Informational Aesthetics and Machines,

Kääriku, August 2006

iii) Kontur Electronic Music Festival, Copenhagen, November 2006

iv) Sound and Music in Public Spaces, Esbjerg, November 2006

v) Mobile HCI International Conference, Espoo, September 2006

D. As a media art installation,

i) Ars Electronica Festival Campus Exhibition, Linz, September 2006

ii) Art's Birthday Party, Moderna Museet, Stockholm, January 2007

E. As environmental sound workshops,

i) Hearing Helsinki workshop, Asia Europe Foundation, Helsinki, May 2006

ii) Interferenze New Arts Festival, San Martino Valle Caudina, August 2006

2 Engaging in sonic environments

IMPROVe is a concept of listening, recording, processing, sharing and improvising with sound, mediated by mobile phones. The main objective with IMPROVe is to listen and engage with sounds that are surrounding us. To engage with IMPROVe willhopefully enlighten the subject about the interesting world of sounds we are surrounded by. Until now the concept has been develop in the context of workshops, installations and performances.

Mobile phones were chosen because they are available, mobile, cheap and have the necessary technical properties for the processing needed for IMPROVe. It is also fascinating to experiment with mobile phones as a platform for working with sound in a non-conventional way. With IMPROVe a particular focus has been in considering interactivity in mobile devices and the development of a graphical user interface for improvising with sound.

To clarify the concept of IMPROVe I explain below the different stages of the concept as instructions for a user. Each set of instructions is followed by a number of questions that emerge from that engagement. Some of these questions are then developed further in the chapters that follow.

2.1 Listening and recording

The first step of IMPROVe is to start to listen carefully to your environment. What do you hear? What is interesting? Probably there will be many sounds which you didn't notice in the first case.

Many people do not listen attentively to what is surrounding them. They only consciously hear the sounds that are very important or that they choose to listen to, for example speech and music. But our sonic surrounding affects us even though we don't listen consciously to it.

The task is then to start to record sounds that are interesting, ugly, beautiful, relaxing, stressing etc, depending on the context and use of IMPROVe. For recording you may use a portable recording device like a mobile phone which you probably would anyway carry around in your pocket everywhere.

This step can be done in one hour, one day or much more. Collecting sounds can be a life-long activity, in the same spirit as taking photos.

First part of this step about how we listen to our environment. Or to what do we listen attentively and to what do we listen passively? What do we "avoid" to listen to in our environment? Can we focus on details when listening to our environment?

The second part is about the activity of recording, where one may ask: Does the recording of soundscapes makes listening more attentive? Or does the action of recording make us focus more on listening? Do we listen to more details when recording sound?

2.2 Transforming

Next step is to listen to the sounds you have been recording. Listen as carefully to the recordings as you listened to them when you recorded them. The sounds will sound different since they are captured with a recording medium. Probably you will get some perspective on what you heard when recording. Maybe the recording reveals qualities of the sound that you didn't hear when recording it.

Now select parts that you find interesting from your recorded sounds. These can range from less than a second to infinite but for later use in an improvising session maximum a couple of minutes is recommended. Usually when playing with the IMPROVe software shorter sounds, up to 10 seconds, is more fun.

Listen to the sounds you selected and cut them out. Do the cut out sounds appear different now than when you listened to all your recorded sounds?

Also listen to your sounds together with your friends or the group that is working with IMPROVe.

How does a recorded sound differ from a real one? This question belongs to the first topic of this activity. Other similar questions are : Is the listening experience affected by the recording equipment and if so, how? How does the recording equipment affect the quality of the sound? How does the listening experience change when a recorded sound is edited?

Next topic is about what kind of sounds do the users produce for an improvisation. How do the users choose sounds for an improvisation? What kind of qualities do these sounds have?

2.3 Improvising and performing

After gathering and making the sounds availabe in the IMPROVe software it is time to start to improvise. This means that you with a mobile phone can play any sound from the group which then will be heard in a sound-system. There are a couple of mobile phones that play one sound each at a time and all of them have

access to all the sounds of the group. All the played sounds are heard in the sound-system at the same time. You can also in realtime control parameters of how the sound is going to be played. The sound is by default looped unless you choose to stop it. You can control the volume, the length of the loop and the playback speed of the sound you are playing. Together with the other group-members you can start to make an improvised composition by choosing sounds and using the parameters to change the sounds.

Since there will probably be many sounds played at the same time it might be difficult in the beginning to find the sound you are playing. If you change the playback parameters on your sound for a while and listen carefully you will find your sound. This activity means that you are only listening to your own sound and not really reacting to the other sounds which are not making it into a collective improvisation. Probably all group-members are doing the same thing in the beginning. It is also an act of learning the instrument. Now stop playing for a while and focus your listening to the whole soundscape that the group produces. Then start to play again and now play together with the others and for the composition that you are making together. Try to especially use the volume of your instrument with which you should not play the loudest possible all the time. Consider that silence can also be used as part of the composition. After a while the group can have a break. Try to start the next session together with an approach that differs from the first one.

The session can be made as a private session with the group or as a public performance. In a public performance, one may invite someone from the audience to play. IMPROVe is easy enough to be introduced to a new participant in the middle of an improvising session.

A question that one may ask for this activity is: Does soundscape recordings work as elements in a musical improvisation? And how can they be used as parts of a musical improvisation? Can they be used as they are or do they need to be transformed to fit an improvisation?

Next question is about how we listen to soundscape recordings in a musical improvisation. Do we listen to the soundscapes as field recordings or do we just listen to them as musical components in an improvisation?

Then the last question: Is it possible to improvise in a group with only simple means of altering soundscape recordings? Or to be more specific: Is it enough to use only a few sounds at the same time which are processed in a simple way to make music in a group improvisation?

2.4 Reflection

Now you have been recording, editing and playing with the sounds that you found. How has these activites influenced the way you listen to your sounds? Have they influenced how you listen to all the sounds around you, both during and after the session? Reflect on the process and your listening.

The last and very significant questions are: How does the process of recording, transforming and improvising with soundscape recordings influence the way the user listens to the everyday soundscape? Do the activities in the IMPROVe concept influence the user's listening after they have completed them?

3 Exploring soundscapes

3.1 Learning to listen

Below I relate the work with IMPROVe to my own background which is a mix of several different interests and practices in this area.

The development of IMPROVe has been informed by my experience as a musician and a sound artist. As a musician trained with both acoustic and electroacoustic guitar, I have become aware of the importance of the sonic qualities of sound. What is often important when I play guitar is the sound of the guitar, more than what is actually played. This comes partly from my pop culture background where the production of the music plays a significant role. IMPROVe uses the sonic qualities of each sound and the whole created improvisation in a similar fashion.

Another aspect of exploring sonic qualities is the activity of recording. I have developed my sensibility for sonic qualities through my field recording practice and experiments with different recording materials. I think that IMPROVe supports the user in getting into this process of exploring the means of recording and listening.

The simple and available means of making music with collected sounds we want to promote with IMPROVe is inspired by my do-it-yourself approach when making music and working with sound. Cheap equipment and not-always-so-good sound quality has not prevented me from making music and doing field recordings. The important thing is to record and start to create something out of it. With IMPROVe I want to make a practice, that historically has been restricted to professionals with access to expensive equipment, available to everyone who owns a mobile phone.

The editing of recorded sounds in the IMPROVe concept is inspired by my own experience of using digital tools to edit sound. This has helped me a lot in understanding the physical qualities of sound, which is an important part of the practice in the frame of this work.

In the improvisation activity in the concept the user manipulates sounds via an interface in a similar fashion as to when making tape loops and tape compositions. I experienced this when I worked in an electroacoustic sound studio where I cut, spliced and looped sounds on tape. This made made me understand the most basic principles of sound

manipulation. The IMPROVe software has a similar approach and is developed from my own custom made software for improvisation which uses the paradigm of tape loops. I found out that I can do a lot in a live performance situation manipulating field recordings with only these simple means. You get very close to the sound itself and can explore many qualities. At the same time these manipulations are quite easy to understand which is important for the IMPROVe concept.

By using IMPROVe I also want the user to get interested in other means of working with and manipulating sound. I have developed my listening and learned a lot about sound by using different techniques of processing sound. Most of these techniques are available through free and open source software. I hope IMPROVe will encourage the users to explore other ways of manipulating sounds.

An IMPROVe improvisation contains many mixed sounds which can for example be faded in and out to create a composition. This is similar to my own practices of soundscape compositions, dj-ing and musical improvisation. To mix recorded sounds to soundscape compositions has been a rewarding experience for my listening to and understanding of environmental sounds. My dj practice has informed the way I think about mixing of sounds in an IMPROVe live performance. You have certain materials and with the help of an instrument you make a creative live mix out of these. This is also the way I work in musical improvisations where I use my set of instruments, which can be analogue, digital, tangible or abstract, to create music.

Another aspect of a dj performance is the reaction to the space. Part of an IMPROVe performance is the space where it happens where for example acoustic, architectural, social and political dimensions interplay. I have developed my consciousness about these conditions when I have worked with the organization of musical events. The location of an IMPROVe performance plays a significant role for the outcome.

The IMPROVe software is developed in open source environments for mobile phones and personal computers. At least at this moment the combined use of these platforms for making improvised music with concrete sounds is a rather unique approach. A reason for developing IMPROVe comes from my background in designing and programming digital systems combined with an interest in using and thinking about these technologies critically and creatively. Technology in this context can be both the use of technologies in society or something more tangible.

I keep on working with many of the activities described above and I constantly develop my listening and understanding of all the sounds surrounding us whether they be environmental, reproduced or synthetic. My hope is that IMPROVe will be a part of this process for it's users.

3.2 Silence and Noise

> *"Modernism thus entailed more sounds and produced a greater emphasis on listening to things, to different things, and to more of them and on listening differently."* (Kahn, 2001).

The reality we live in today is full of sounds which we have to listen to whether we want it or not. Some of those sounds are unwanted sounds and are generally called noise where noise is used in a negative way. Ways to cope with all the noise can be to ignore it or to seek silence. These sonic conditions are crucial parts of our modern life. In this text I present some theoretical and personal considerations about silence and noise that is related to the work with IMPROVe.

Starting from noise which is not always negative and can contain a lot of interesting details if we listen consciously. An early example of this is Luigi Russolo's *The Art of Noises: A Futurist Manifesto* written in 1913. Noise is regarded by Russolo as something to listen to and to use to make music with. The noises Russolo is referring to are the sounds of the industrial cities; cars, trams, machines and crowds of people. He proposed to take control over these sounds which then will "enrich mankind with a new and unsuspected pleasure of the senses". Using the Futurist ideas on industrial noises they could be used as parts of musical orchestras. For this purpose he is discussing noise in musical terms such as pitch, rhythm and timbre. Eventually he and his Italian Futurist colleagues constructed instruments which produced noise and was made for making music.

The organization of sound into music that Russolo was working with is a present element when composing with or playing any traditional instrument. But Russolo was among the first to organize noise or concrete sounds into music. Many aspects of this were later developed, both theoretically and practically, by John Cage (1961). Both with my own work with sound, and with IMPROVe, I would say that organization of sound is a method on how to listen to noise. The organized sounds themselves might be noise and the output of the organization might be noise. What is called noise depends on the context, but some of the sounds used in IMPROVe could be regarded as noise. Also sessions with IMPROVe can be regarded as noise if you expect to hear the ordered organization of sounds that is common in traditional western music. I claim that by listening to music which is referred to as noise you start to listen to your environment in a different way. Sounds from your environment that you earlier would ignore and classify as negative noise are suddenly quite interesting and you might also start to listen to silence differently. But as Robert Worby writes what is regarded as noise-music is changing constantly (2000). I can only refer to my own experience.

My own relation to noise which has developed my listening to environmental sounds has a lot to do with music. I therefore elaborate on some musical experiences in the following paragraphs. One of my first noise-music experiences was a concert by the Japanese artist Merzbow. It was one of the loudest concerts I have been to and I physically felt the concert more than I heard it. What I felt was mostly the lower sound frequencies of the concert. To make a very simple comparison you can place a jet-engine in a room and run it on full power to reach a similar effect as this concert. After this I started to think about the physical dimension of sound and what a sound-wave actually is. I also started to listen more carefully to and think more about loud sounds produced by machines.

Another revealing experience was a concert with the Spanish musician Francisco Lopez. It was one of his “blind” concerts. The audience is sitting together with Lopez in the middle of the room surrounded by speakers and you are wearing blind folders so that you are in total darkness. The blind-folds enhance the aural experience since your hearing sense is becoming much more important. The concert started with slowly increasing synthetic sounds that reached the level where my ears started to hurt. Then it stayed there for a while to suddenly just disappear and the concert hall was silent. It was a strange feeling since I was blinded and my sense of the room was relying on the former sounds coming from the speakers. It was like falling and I was searching for some sound to get me and the space into balance again. Now I started to hear all kinds of sounds from the room that I was previously not aware of. After this experience I started to think more about spatial dimensions of sound and also about silence. As John Cage's famous experience in a soundproof anechoic chamber showed: total silence does not exist (Toop, 2004, p. 7). One will always at least hear the sounds from your body. And outside the anechoic chamber one can hear a lot of things in places that are considered silent.

So noise-music can also be silent. An example is the album “Second” by the American musician Kevin Drumm which is very silent compared to a normal produced rock-album. When I listen to the album at home I am not only listening to the sounds coming from the speakers. I am listening curiously to the play between the sounds from the speakers and the sounds from the room and the building where I am. To listen to this kind of music has helped me a lot in developing my listening.

These three experiences are more or less from spaces in buildings. But the changes in my listening that they caused are not restricted to spaces in buildings. It can be listening experiences of streets in cities, factory sounds, parks, country-side silence and forests to name a few. The three experiences represents only a fraction of events that has influenced my listening. It has been a process over several years including different listening situations such as making field recordings, playing music and traveling. To exemplify I present two sound examples that is part of my activity both as a listener and creator of

noise and silence. Both of them relates to noise, in our environment and as music, where the first one is my recording of a Japanese Pachinko game hall in Tokyo and the second one a cut out from an improvised musical performance with the group Squidroses which I am part of (Audio: track 1, 2). Pachinko is a kind of mix between slot machine and pinball machine and the Pachinko hall I visited was full of those where every machine made some sounds and at the same time there were sounds coming from the main sound-system in the hall. The Pachinko hall recording is done without me interfering at all, just walking around in the game hall. The Squidroses recording is from our performance in the Placard 2007 festival at the Art's birthday event in Helsinki. I bring those two into focus since I think there are similarities in the play between chaos and organization of sounds in both recordings although they originate from very different contexts. They can also serve as examples to the earlier discussion about noise in our environment and the noise music that has inspired me.

It has been important for me to explore what is considered noise and realize that the boundaries between noise, music, silence and all sorts of everyday sounds are not so strict. Although my own listening to these sounds has been developing for several years I believe that a single event such as an IMPROVe workshop can influence the way one listens to the environment.

3.3 The Soundscape

According to the Canadian composer and theorist R. Murray Schafer the whole world around us is a musical composition: The Soundscape (1973). He and his colleagues started to work with Acoustic Ecology which is about studying the sounds surrounding us. Schafer made an effort to produce a cultural history of sound and listening and also how to analyze sounds in our everyday environment (Schafer, 1977). His work is very relevant for IMPROVe even if some of it has been updated since he wrote his book about soundscapes in the 1970s. I will here elaborate on parts which I found especially important in this context.

Before the industrial revolution the soundscape was clear with some sounds breaking the silence which often included some information for the listener. What Schafer calls a *hi-fi soundscape*. However during the industrial revolution machines started to appear and they often sounded loud and for long periods of time. This is called the *lo-fi soundscape* which makes it difficult to hear individual sounds since there are loud sounds masking out the rest of the sounding environments. And the lo-fi soundscape has been developed since the industrial revolution with for example more traffic and more machines. In order to live with a constant lo-fi soundscape we have to forget to listen to our environment.

Using a more common term I would interpret lo-fi soundscape to be unwanted noise.

Schafer is proposing ear cleaning exercises which is about training to listen to sounds and sounds of the environment. Related to this is the concept of *clairaudience* which is a word for clear hearing particularly when it comes to environmental sounds.

He uses some terms for identifying parts of the soundscape where he distinguishinges between *keynote sounds*, *signals*, *soundmarks*, *sound objects* and *sound events* (1977).

A keynote sound is for the soundscape like the keynote of a musical composition. It is setting a certain environments atmosphere and character and is influencing the people living there. Even though it is not listened to consciously. Can be defined as background sound.

Signal is a specific sound that is consciously listened to. Compared to a keynote sound it is in the foreground of the soundscape.

A soundmark is comparable to a landmark. A sound that is specially regarded or noticed by people in a community. Often a unique sound.

Sound object, which comes from Pierre Schaeffers l'object sonore is "the smallest self-contained particle of a soundscape" (Schafer, 1977, p. 129). A sound object is just considered as an object without any semantic or referential aspects.

Schafer's referential sound object is called a sound event which is a symbolic, semantic or structural object. A sound event occurs in a limited time in a specific place and it belongs to a context.

This model of how to analyze sounds is a helpful approach towards understanding and listening to the sounds surrounding us. It has helped me when working with and recording specific sites. But more in the moment of listening to the recorded soundscape than in the moment of listening or recording the soundscape on site. When I am on site I usually just want to sink into concentrated listening without thinking too much. It is like listening to music for me; more about getting into the flow of the music and loosening up the sense of time and space.

The recorded soundscape is different than the real one since it is a more "flat" interface where all the sounds to a greater extent have equal volume than in the real. Therefore some way of dividing the parts of the soundscape is needed when working with compositions or mixes of recorded soundscapes. I often think of the parts as layers in the soundscape which does not follow Schafer's model but his model has helped me to get started in my process of analytical listening to soundscapes. This is the main reason why I include the soundscape model here. An important activity with IMPROVe is to listen carefully to the soundscape and to divide the soundscape into different parts or layers can

be one way of getting deeper into listening.

One example how to use the soundscape model for an IMPROVe event is a soundscape recording from the bazaar in Izmir, Turkey, during one of the prayers (Audio: track 3). By the first listening it is easy to just focus on the speech of people in the foreground and the prayer. But in the background there are sound events such as spoons used in coffee cups and mobile phone sounds. This recording should be listened to in headphones since it is a binaural recording. Then one can hear or "feel" the keynote sound of the bazaar which I consider be the narrow space, where there sounds don't travel far and the volume normally doesn't get very loud. At the time when it is recorded I would consider the prayer being part of the keynote sound.

The soundscape model is only one way of listening attentively to the soundscape. I developed my own way of listening to and working with soundscapes before I found out about Schafer's concepts. One example is my soundscape composition Tokyo 10:56 (Audio: track 4). In this piece I worked with the very different soundscapes of different places in Tokyo. Then I used the concept of an artifical journey between those places and spaces when I mixed it. The movement between the soundscapes is important in this composition.

So what is a soundscape composition? According to one of Schafer's colleagues, Barry Truax, it is a composition in which the environmental context from where the sounds are recorded, plays a significant role (2001, p. 236) . A soundscape composition plays with the perception, memories, knowledge and experience of the listener in relationship to the used soundscape(s). The listener's awareness and attitude towards the soundscape might even change when listening to a soundscape composition. Since a soundscape composition in different ways plays with the original sounds as they were recorded, it can be seen as a game between the referential and the abstract or between real and imaginary.

I did not know about the definition above when I made my Tokyo composition but I think it fits into Truax' definition of a soundscape composition. I also think that this approach from Truax is a bit different from mine. The soundscape model, that Schafer and Truax present, seems to focus much on how to preserve and recover natural or traditional soundscapes where the noises created by modernity should be eliminated. According to Hellström (2007, p. 77) the soundscape-movement is idealizing the life in the country side and criticizing the urban life-style. I think the soundscape-movement has made important contributions to the discussion about how we want to experience our everyday sonic life and I also appreciate the silence of the country-side. But I agree with Hellström and think that the sounds of modernity can be used creatively if you have an open approach towards them.

How is soundscape composition related to IMPROVe? In the activity of improvisation

and performance with IMPROVe, you use parts of recorded soundscapes to make a live composition. The site of recording and performance is important as well as to somehow recognize the sounds in the performance. All this is comparable to a soundscape composition. But with in a similar argument as to my Tokyo composition I would say that an IMPROVe session is not really a soundscape composition. It also belongs to a culture of experimental musical improvisation and free use of any sound.

The soundscape model's way of listening to and analyzing environmental sounds is a crucial contribution on how to work with sounds. I consider it as a framework to use with care in the IMPROVe concept.

3.4 Reproducing sound

Brief history

The invention of the phonograph in the 1870s was the starting point of a change in the way we listen to sounds. To start with, the phonograph was used for voice but later it was also used for music and became the gramophone. The use of music on the gramophone opened up the possibility of reproducing all sounds. Sound, whether it was voice or music or something else, could now exist outside it's own time and space (Kahn, 2001).

The gramophone as a technology for reproducing music started to be used widely in the late 1920s. It was not used for recording and manipulating any or everyday sounds until Pierre Schaeffer made his *musique concrète* with gramophones in 1948 (Cutler, 2000). Soon the tape-recorder took over the gramophone's role as the technology to record and manipulate sound.

The tape recorder was commercially introduced in North America in the late 1940s where Tony Schwartz started to use a portable tape recorder for recording the soundscape of New York. Earlier he had recorded folk singers and with the soundscape recordings he started to realize that he was surrounded by a living folklore. His recordings were released as records and also mailed out as a tape exchange project with participants in other parts of the world (Truax, 2001, p. 219).

The sharing and exchanging of field recordings can today be done on the web, for example in the freesound project where you can easily share your recordings and browse a huge database of other people's recordings. Another example is "das kleine field recordings festival" which in winter 2007 happened both in a physical location in Berlin and online. There are many non-professional practitioners involved in both these examples who share their soundscape recordings and compositions using simple means. This is an inspiration for IMPROVe which is intended to be used in a similar spirit.

Recording technology

The historical importance of the portable tape recorder as available field recording technology can not be underestimated. Today the minidisc, which I see as a digital variant of the tape-recorder, is used by many people for field-recordings. The minidisc is cheap, portable and has a digital recording quality which is decent for the price you pay for it. Interesting is that it was introduced as a digital walkman designed for use as a music-listening device and not as a field recording device. This non expected use of technologies is part of the whole history of sound recording and music development.

With IMPROVe the intention is to use the mobile phone as an available field-recording device. Positive is that phones are not too expensive and they are widely used. But right now they is not at all designed for field recordings. The recording function of mobile phones is designed for making voice notes and the recording quality is not so good.

The recording quality on phones is especially not suitable for soundscape recordings since it is often difficult to hear any soundscape at all. The sounds heard will mostly be voices or sounds in the frequency range of voices. An example of a field recording with a mobile phone is my recording of a training session in an outdoor hockey-rink (Audio: track 5). Even though I was standing quite far away from the rink you do not hear the space of the distance on the recording. It sounds like I am standing in the middle of the rink with the players coming very close to me. The recording is interesting for it's own sake but it misses the whole aura of hearing the hockey-sounds in the outdoor space. Another example of a mobile phone recording is from a bar in Helsinki (Audio: track 6). Someone is playing piano in the bar and in this case the piano together with the talking crowd in the bar actually gives a hint of the space on the recording. So maybe the mobile phone recording quality is better suited to capture the soundscape of a smaller crowded space than an outdoor space?

Practically you can use mobile phone recordings for IMPROVe. But the problem is that when you play them in a sound-system they tend to be difficult to listen to. The mid-high frequencies that are louder in these recordings tend to hurt your ears when listened to louder in a sound-system. Also if you play several of these recordings at the same time it is very difficult to separate the sounds which is one important aspect in an IMPROVe session.

The quality issue is the reason why we have used decent digital sound recorders for IMPROVe instead of mobile phones. The digital recorders we used are consumer oriented recorders which have better recording quality than the minidisc and are a bit more expensive.

The tape-analogy, which is still present in the minidisc format with their discs with tracks,

is gone with new digital recorders since you record straight onto digital format such as flash-cards. The recordings are then visible as files on the storing media. I believe that they will replace the minidisc as the main tool for cheap field-recordings. Or perhaps there will be a bigger diversity with gear used for simple field-recordings. Any digital portable device can in theory be used for recording sounds. It is just a matter of software-design and what kind of sound-circuits are used.

Aural reproduction

The possibility to record greatly alters our relationship to sound. Barry Truax writes that recording technology "frames reality and, hence makes us more intensely aware of it" (2001, p. 219). It can be used as an extension of listening and enhance our aural awareness with emphasis on *enhance* since I believe that it is impossible to fully reproduce the sonic aura of a space.

Instead we find other auras in reproduced soundscapes which also makes us more aware of the aura in reality. Or to put it different: recording technology helps us to hear sounds that we didn't hear before we recorded a certain soundscape. One example is my field-recording from a beach in south-west Sweden during night-time (Audio: track 7). It was recorded during a calm and quiet night and I mostly just heard the small waves when I was recording it. But when I later edited the recording I filtered out some of the higher frequencies and suddenly there were sounds which I did not hear before. I find the oscillating "singing" mid-frequency sound especially interesting. I am not sure where it comes from but one guess is from the machines of some ship far away since sound can travel very long distances on a calm sea. So with the help of a minidisc recorder and a microphone I could hear things which I did not hear before. I compare this to what Walter Benjamin writes about film with which we can make close-ups of the things around us and focus on hidden details, and in that way open up our field of perception (1935). It is the same thing with sound with the possibility to cut out and filter or enhance frequencies to make sonic details available.

A quite extreme example of how recording technology can reveal sounds that we would not hear otherwise is my recording of the ice of a lake Sången in Sweden where I froze down a contact-microphone into the ice (Audio: track 8). A contact-microphone is reacting to vibrations of material whereas a normal microphone is reacting the pressure in air that sound-waves are making. So what you hear is the ice of the lake moving and cracking. Some of those sounds are also heard on the surface of the lake, but sound different when they get into the air. So this recording let us listen to things that we normally can't hear no matter how hard we listen. Even a normal air-pressure driven microphone, as I have shown with the Lahälla recording, mediates the recording and

influences our listening. So far we have never used contact-microphones with IMPROVe but that might happen in the future.

It is also a fact that with a recording device and a microphone in your hands you start to listen differently. Since you are aware of that, you listen more carefully to the different parts of the soundscape around you. Obviously this depends on what you are recording but in the case of IMPROVe we have been working with recordings of any interesting sounds in a particular environment. Then you get very sensible of what is going on around you and actively listen to find something interesting to record. This is one of the tasks with IMPROVe; by having a recording device in your hand you start to listen more carefully to your environment. Also that the recordings for IMPROVe reveals more about our heard reality when they are played back from speakers outside their original context.

An example of a close-up recording of reality that was done with IMPROVe is the recording of a restaurant kitchen in Zürich (Audio: track 9). The sounds in the recording are probably typical sounds of a restaurant kitchen which you normally don't notice. But in this recording you get a close up of a small detail or moment in time of the sonic flow in this kitchen. If you listen to the version which is looped with the IMPROVe software (Audio: track 10) you start to hear more details of the recording and realize that there are many sound events in this short moment of time. You also start to hear the space and that there are sounds both close and far away in the recording. This sound was used in the IMPROVe performance in Zürich in July 2006 and it is a typical example of how IMPROVe can be used. To take details from the sonic surroundings and put them into a new context will hopefully reveal new aspects of the everyday soundscape.

Another interesting feature of the kitchen recording is that it was probably possible because of the use of binaural microphones. We have been using binaural microphones quite often in our IMPROVe workshops. The model we used looks like a pair of normal headphones of the kind that you put in your ears. But there is no speaker-membranes in those, only microphones on the outside. So with them attached to a portable digital sound-recorder which has the same size as many popular portable audio-players you look like someone listening to sound rather than recording sound.

Illustration 1: I am to the right using binaural microphones and a portable digital recorder

The advantage of using binaural microphones in a situation like in the restaurant is that no one knows that you are recording. And that is often an crucial advantage when you are recording in cities. If you come with a microphone in your hand people notice that and might start to act differently or simply avoid you.

The possibility to record with "hidden" equipment is an interesting aspect of using the mobile phone for recording sounds. Many people have mobile phones in their hands and if you use your mobile phone as a sound recorder I don't think anyone will take notice. This might be a good feature of IMPROVe in the future if we get the chance to record with better quality.

Binaural microphones are also interesting to use in capturing the aura of a space. The idea of binaural microphones is that the sound reaches the microphone in the same place as the sound comes to your ears. This means that the sound is bouncing, getting shaped and reaching the microphones in the same way as when you listen with your ears. So when you listen to a binaural recording in headphones you will hear the sound in the same way as if you were in the place where it was recorded. It gives you a quite good three dimensional experience, not as good as in reality but enough to give you a hint of the aural experience of the recorded soundscape. Those recordings normally also give a quite good spatial playback in sound systems as we have experienced with IMPROVe

performances.

Technology for reproducing sound with decent quality is accessible today with digital recorders. Also mobile phones can be used for recording but the quality for recording soundscapes with them is so far not good enough since you will loose too much of the aura. Good recorders also alter the aura when recording soundscapes but in a more positive way since they might reveal hidden layers and details of the sonic reality. This feature can be used creatively and make us more aware of all the sounds around us. In the activity of recording in the IMPROVe concept we hope that the user will start to listen more attentively to reality.

3.5 Sound objects

Murray Schafer calls the technology for storing reproduced sounds Schizophonia (1973). He refers to "the split between an original sound and its electroacoustical transmission or reproduction". The original sound source and it's reproduction are taken apart and the latter starts to live it's own life independent from the original. It can be put in other contexts and bear different meanings and become and object on it's own. This is what Pierre Schaeffer is elaborating on with his sonorous object as the original term l'objet sonore is translated in the text I used (Schaeffer, 1966).

Pierre Schaeffer worked as a radio producer in Paris in the late 1940s. With technology such as gramophone and later tape-recorder he started to compose *musique concrète* out of everyday recorded sounds, so called concrete sounds (Truax, 2001, p 133). Schaeffer composed with sonorous objects where the used sounds were taken out of their original context and should be listened to and interpreted only as they appear in the composition, without references to their original context. (Schaeffer, 1966).

A sonorous object is a reproduced sound object which is independent from any causal references to it's origin[1]. Listening to a sonorous object is to listen without associating to it's origin and instead listening to exactly what you are hearing, which is called acousmatic or reduced listening. Reduced listening is ".. the attitude which consists in listening to the sound for its own sake, as a sound object by removing its real or supposed source and the meaning it may convey" (Ears: Electroacoustic Resource Site).

Since a sonorous object is a reproduced sound and saved on media it can be manipulated in various technical ways. Schaeffer is mentioning cut, splice and speed which refers to

1 Schaeffer's concept of the sonorous object seems to play an important role in the history of listening, sound, music and technology. 1966 he published the book Traité des objets musicaux which unfortunately only is available in French (which I don't read). The only English translation I found was the chapter called Acousmatics where the sonorous object is explained quite briefly and is hard to grasp. Therefore I use the term here in my interpretation of the short article.

the use of magnetic tape. The sonorous object will after the modification occur to us either as a variation of the same object or even as a new sonorous object depending on our listening. If we listen to a manipulated sonorous object and we do not reference it to the original sonorous object, it is a new object. In that way each manipulation can create a new sonorous object.

Schaeffer's work both as a composer and a theorist has been very important for the development of electroacoustic music. His ideas on the sonorous object is still an essential part in discourses related to sound. But I would say that his formal approach to sound is part of a modernistic tradition which also his followers in "traditional" electroacoustic composition belongs to. They were mostly concerned with material and formal innovation in the studio. Today the postmodern approach can be seen as attempts to break down the former efforts towards perfection. Practices like DIY aesthetics in electronic music production and field-recordings and recontextualization of sounds in sampling culture are some examples (Waters, 2000, p. 70). I think IMPROVe learns from and considers both these traditions.

The sonorous object is valuable in the discussion about mediated listening. Although with some modifications. Luke Windsor proposes that reduced listening is impossible since we have natural affordances to many of the sounds around us (2000). An important part of how we perceive this world is with our listening sense and some sound events are so significant in our daily life that we can't really listen to them as true sonorous objects. Windsor argues that the quality of acousmatic listening lies in it's play between real and virtual where there is simultaneous perception of two kinds of structured information. Both the meaning of the sounds and the representation of the sounds when they are played through speakers.

I can see the relevance of Windsor's view on the sonorous object for IMPROVe. I would like to call the sounds that is edited out and used in an IMPROVe session sound objects. And with this I make a distinction between the sonorous object and the sound object. The sound object is partly a sonorous object and partly a referential sounding object. These objects appear when fragments are chosen and cut out from field recordings in the IMPROVe process.

In the activity of choosing these fragments the listening to the sonic qualities of the recorded sounds can be close to the concept of reduced listening. The field-recordings are listened to very carefully and interesting sounds can be picked out because of their qualities as sounds regardless of their meaning. After they have been chosen and cut out they appear as separate entities taken out of their context and can then be called sound objects.

The meaning of the sound object is still an important part of how they are used in an

IMPROVe session. To recognize asoundscape from the area close to an IMPROVe session is part of the idea of that the mediation of sounds might affect your listening when you hear that soundscape again in reality. Also some sounds might not be soundscape-recordings at all. They can just be any sounds that is fun to play with in an IMPROVe session.

An example of how a sound object can be both non-referential and referential is a police siren recorded for the IMPROVe performance in Zürich (Audio: track 11). The sound could be listened to as a high pitched oscillating sound with some reverb. It is an interesting object to change the playback speed of in an IMPROVe session because it has a certain pitch which for example can be used for making melodies. But it is still easy to recognize it as a police siren and the meaning of the police passing by or getting closer can be a nice spice in an IMPROVe session.

The sound objects used in IMPROVe can be sonorous objects, recognizable soundscapes, synthetic sounds, musical sounds and more which will sound different in different sound systems and spaces. The important thing is to listen to them in different ways and understand how they can be listened to and interpreted different depending on the context. They can be used as musical objects, as memories of an event, as soundscapes or sounds with interesting textures and qualities.

3.6 Improvising with sound

There are many ways of improvising with and organizing sound into music. IMPROVe is a tool to work with sound in an organized way which in the end is music. But how and what kind of music depends heavily on the context where it is used. Significant questions when discussing the music that is created is: Who is using it? What sounds are recorded? Where is the session taking place? Who is involved in the session?

The way that IMPROVe is designed for making music is related to my own experience in improvising in different groups. I have for example participated in many rewarding improvisations in the Helsinki based group Impromasters. In these improvisations I have mostly used a laptop to modify some of my field-recordings in realtime. The size of the group ranges from two to 20 people. The emphasis have been on free improvisation together so there is no manuscript and usually not much of pre-agreements on what and how to play. Most of the attending improvisers have had laptops or some electronic instruments and come from very different backgrounds ranging from educated to self-learned musicians to sound artists.

When working with digital sound manipulation in this kind of free improvisation one can use very diverse strategies. Examples include work with frequencies, soundscapes,

voices, timbre, spacial aspects, rhythms and melodies. And one doesn't need to be a trained musician to learn to master any of those strategies. It is about learning to listen and respond in the same way as with traditional instruments but with an interface that one can adjust to a suitable level for expression. The interface of the IMPROVe instrument is very simple because it should be usable for non musicians and people with no experience in sound manipulation. I hope that the listening and response in an improvisation is possible for these groups with the IMPROVe instrument.

It is discussable if the output of all improvisation works for musical listening but I think that the learning outcome for the participants is always valuable. When many people improvise at the same time there will be many sounds at the same time and every participant has to listen very carefully to respond to the sounding body. In this process one learn how sounds can change shape when put together with other sounds. And it is actually fun to be in this learning process.

To improvise with IMPROVe shouldbe fun regardless of the context and the participant's musical background. With the experience we have had so far most people enjoy participating in the sessions. It is very inspiring to hear people that have never played together before, might never played with any electronic instrument before, and might not even played music before, improvise and really listen and respond to each other. This proves that they actually listen carefully to the output of many simultaneuous sounds and manage to find their own sound, reacting to what other people play. Just as in any musical improvisation.

To organize sound into music with the help of IMPROVe will hopefully make one listen more careful to all the organized and non-organized sounds in the surrounding world. If this happens the heightened sonic awareness that we want to promote with IMPROVe is reached.

4 Field experiences

To make it easier to understand the IMPROVe concept I am here describing and commenting on some of the workshops and performances that have been made. They are presented in chronological order.

4.1 Performance in Central Railway Station Helsinki

This performance was part of the locative media workshop during the Pixelache festival for electronic art and subcultures in April 2006.

The sounds used in the performance was recorded by the workshop participants during the locative media workshop and the sounds were all from the railway station. The instructions given was to contribute with any interesting sound from the workshop ranging from a couple of seconds up to one minute of length. The sounds are for example machine sounds, spatial sounds, voices and synthetic voices. Most of the sounds have more or less of the aura of the big stone halls of the railway-station. These spatial sounds are almost always present when recording there (Audio: track 12, 13, 14, 15, 16).

The space was also a crucial factor during the performance. The sound coming from the speakers was amplified by the echo of the stone hall where the performance took place. The participants from the workshop started the performance and played together with four mobile phones. The audience and people passing by were invited to play after a short while. The mobile phones were passed around and the participants from the workshop explained how IMPROVe works. I gave the workshop participants instructions to start carefully to build up a crescendo. Quite soon it was obvious that the instructions didn't work for the space and the context. It was a very unstructured improvisation where most improvisers just tried out the software and the possibility to make noise in the public space (Video: Pixelache).

This was the first IMPROVe public performance and it was an interesting one. To give back the sound from the soundscape in the railway station into the same soundscape was fascinating. Especially since the acoustics is such a present factor and gets even more present when you play the recorded acoustics back into the same space. And to be able to control this very dominant sonic factor with just a small mobile phone was involving. Most of the people who came to see the performance came from the festival but many by-passers stopped for a while to check what is going on. We got good feedback after the performance and got more convinced that this might work in other places as well.

Some technical problems were present. The wireless connection between the phones and the computer got stuck sometimes and the software on the computer crashed after a while. Which meant that everything had to be restarted. This issue is still not solved and has been a present factor in many performances. Therefore someone with knowledge about the IMPROVe software has to look after it during the performances.

After this event I realized that it is more interesting to play with sound objects with shorter lengths with IMPROVe. A one minute sound object work good as a background texture but is not so easy to manipulate with IMPROVe. So in later performances we mostly used sound objects which were from 1 second to around 20 seconds long.

Illustration 2: Performance in Helsinki central railway station. Photo: Antti Ahonen

4.2 Workshop at the Master of Arts festival

This was a one day workshop in May 2006 in the Master of Arts exhibition at the University of Art and Design Helsinki. The workshop was more like an open demonstration. IMPROVe was set up with phones and speakers in the cafeteria and people who passed by could try it out, fetch some more sounds and improvise together with other people. Most people were just trying out to improvise and there were some good moments. Best one was when a mother and her daughter took one phone and played with it every now and then while they were having lunch. Two boys had one phone each at the same time and were sitting playing without knowing about the mother and her

daughter. And they actually started to play with each other without seeing or knowing the other part. There was clearly communication going on within their improvisation (Video: MoA).

The sounds that were used were a mix of sounds put together by us consisting of field recordings, mobile phone recordings, voice sounds and also electrical guitar. We found out that it is fun to play around with sounds from an instrument. Especially mixed with environmental sounds. This set of sounds has also been used while demonstrating the IMPROVe software to show what you can do with different kind of sounds (Audio: track 17, 18, 19, 20).

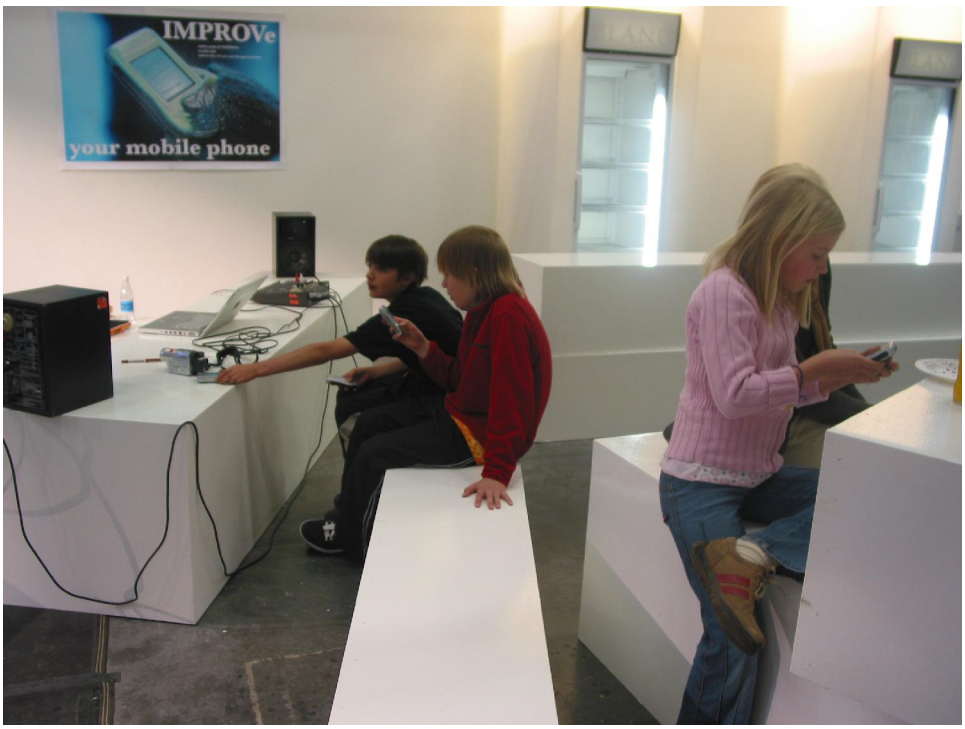


Illustration 3: Master of Arts workshop

4.3 Hearing Helsinki workshop and performance

This workshop was organized by Asian-European Foundation together with University of Art and Design Helsinki in June 2006. It was an almost two weeks long workshop about sounds in Helsinki with a group of 20 European and Asian art and design students. I was part of the group who organized and was teaching in the workshop. One of the events in the workshop was the public performance with IMPROVe in the Myymäla 2 gallery in Helsinki.

The sounds used in the performance came from sounds that the workshop participants

collected during the Hearing Helsinki workshop. Every participant contributed with at least two short sounds that he or she found extra interesting. The sounds were of very different kind and character, from soundscapes to tiny details to electromagnetic radiation. All samples were of high quality since the workshop focus was on sound and the participants all had experiences working with sound before. So far this was one of the most fascinating collections we have got for IMPROVe (Audio: track 21, 22, 23, 24).

This improvisation was done in two parts which were approximately 15 minutes each. For the first part all of the participants were allowed to just play around with the interface and the sounds to get used to how it sounded in the space. The were told to start to listen more carefully to the other sounds and play with each other as soon as they felt comfortable with the instrument. This time we used eight phones so the amount of sounds together demanded the participants to be careful to not play out each other too much. The phones were passed around among the workshop participants. Also some of the audience participated.

After the first session we had a short break and I told the participants to try to really play together the second time since they now knew the instrument and the acoustics of the space. I asked them to pay extra attention to how they used the volume and how they put their sound in relation to the other sounds. The second improvisation started out much slower and more careful than the first. And you could hear that they were now more skilled to play together in the group with the instrument. They managed to create a nice composition playing together. Also the ending of the improvisation came quite natural (Video: Myymala2).

This was an inspiring session with IMPROVe. I appreciated the use of the interesting sound objects and improvisers with experience working with sound and music. The group seemed to have a good time using IMPROVe. Due to some circumstances there were very few members in the audience. It could have been more interesting with a bigger audience since it was a public event.

4.4 Performance at Cabaret Voltaire

This performance was part of the Digital Art Weeks festival 2006 in Zürich. Since the festival was happening in the city environment of Zürich we decided to use pieces of the soundscape in Zürich for the performance. Since it was not a workshop I recorded and selected all the sound objects from Zürich to use in the performance. I was never in Zürich before this and I think that influenced my choice of recordings since I listen more attentively when I visit new places.

I had two recording sessions during two days lasting between two and three hours each. I

spent the evenings editing out sound objects for the performance. I found some interesting sounds in the old part of Zürich. The acoustics of the narrow streets and the lack of cars made it possible to record interesting details. For example people speaking and kitchen sounds from restaurants heard on the street. Examples of other typical Zürich sounds that I recorded were water places, trams, church bells and the counters of a busy supermarket (Audio: track 25, 26, 27).

The performance happened in café Cabaret Voltaire, famous as the birth-place of the dada-movement. We asked three friends who have some experience as musicians to start the session and they got some time to try IMPROVe and prepare for the session before the performance. The session was then held in one of the small bar-rooms of Cabaret Voltaire with no stage and with our friends starting to play in the middle of the room surrounded by the audience. I had a short speech before the session telling that the phones will be passed around and that everyone can participate in the improvisation. The start of the session was nice to listen to since we had the prepared performers playing. Usually the start is very messy since everyone is just trying to find their sound and play around with the instrument. The start showed for us that IMPROVe can also be used creatively by prepared musicians. After the introductory session the phones were passed around in the audience. As usual with IMPROVe performances some parts are just about the players trying out the instrument and in some parts people are playing together and making music. I deliberately made it possible to play loud since that normally makes the improvisers play more dynamic. With a loud sound system you can play loud if needed but you also have to adjust to the other improvisers. In this way the volume control of IMPROVe becomes a crucial part of the instrument (Video: CabaretVoltaire).

This event was the first IMPROVe performance and sound collecting activity outside Finland. It was successful in that the sounds worked good, the prepared performers played well and the audience was engaged in improvising.

Illustration 4: Performance at Cabaret Voltaire

4.5 Performance at Futuresonic

This performance was part of the Futuresonic, Urban festival of Electronic Music and Arts, July 2006 in Manchester. Before we got there we got in touch with Tullis Rennie a sound art student from Manchester University. He recorded soundscapes from Manchester for the session according to our explanation of what IMPROVe is. The recorded soundscapes were good but we realized that it is difficult to collect sounds for IMPROVe without trying out the instrument first. The sounds that works best with IMPROVe are short sound events or sounds with many details. Most of the recordings we got from Tullis were nice general soundscape recordings from Manchester which did not contain too many shorter sound events. They worked good as textures in the IMPROVe session but they were not so interesting to play with since the sound processing functions of IMPROVe does not change them so much (Audio: track 28). So apart from using Tullis' recordings in the session I also recorded sounds from Manchester which were based on shorter sound events. For example a street musician, children running close to a fountain, the lifting of a barrel and inside a café (Audio: track 29, 30, 31, 32).

The performance differed a little from the former ones. It was more like a mix between demo, installation and performance. We were situated outside the building of the Museum of Science and Industry where the Futuresonic festival was going on. We had a sound system in which IMPROVe was playing for approximately two hours. People passing by got involved and played for a while before they went on. It was a new and a bit odd experience since IMPROVe is more about a specific performance at a specific time. Interesting but this is not how we prefer to frame IMPROVe in the future.

Illustration 5: Performance at Futuresonic

4.6 Workshop and performance at Interferenze

This event happened in Interferenze New arts festival in the town San Marino de Valle Caudina, Italy, in August 2006. The festival theme was Naturalis Electronica where projects working with the local environment in some way where invited. It took place in the forest outside the town.

This time we had a workshop a day before the concert where we collected sounds together with participants from the festival. The workshop was announced in the festival program and anyone could join. The workshop was organized together with Jean-Philippe Renoult, Kate Sieper and Dinah Bird who were also working with the local soundscape. The workshop started by introducing acoustic ecology and the concept of IMPROVe, after this we had a session where the participants could try out the IMPROVe instrument. Then we went out in the forest with the participants to collect sounds for the performance. We walked silently and tried to listen carefully but we did not hear more than the forest ambience. This made it difficult to record anything particular so the group started to produce their own sounds with the help of the forest. For example rustling with leaves, shaking found acorns and yodeling towards a valley (Audio: track 33, 34, 35).

Illustration 6: Workshop at Interferenze

Even though it was hard to find sounds to record the participants seemed to enjoy this activity. To listen concentrated to a silent forest together with other people was inspiring for some of the participants. They said they normally don't listen that attentively to their

environment. So the exercise served it's purpose and in this case the recordings were not the most important thing.

The sounds were then edited into sound objects by me. It would have been interesting to let the participants edit them but there was no time or equipment for that.

Our collaborators were also part of the performance group and had their own instruments using their own soundscape recordings. They started the performance, the workshop participants joined in later and then the audience could also play with the IMPROVe instrument. The performance was quite different this time since the group starting it were experienced improvisers. They more or less showed the way through the whole performance and the IMPROVe users was following them. It worked out well and was a pleasant concert experience. The stage was an outdoor stage in the same forest from which we recorded sounds.

4.7 Performance at Ars Electronica

IMPROVe was both a performance and an installation at the campus exhibition of Ars Electronica 2006 Festival for Art, Technology and Society. The most interesting part in the context of this thesis was the performance.

The sounds for the performance was collected and edited by me during two days in Linz. The working method was similar to earlier IMPROVe setups. I collected sounds from Linz and then edited some of them into sound objects. The performance was held in a bar which during the performance evening was very crowded. We shortly introduced IMPROVe and how it works before we started then some friends of us started to play and share the phones among the members of the audience. We had six phones and since it was so crowded it was practically impossible for the users to know who else was playing at the same time. But yet you could hear that people managed to play together with each other. And this was an interesting outcome of the performance: That performers who did not see or know each other, could play together with an instrument they most probably had never tried before.

5 System design

The IMPROVe prototype for the improvisation part of the concept is developed for mobile phones and computer. I briefly explain below how the different parts work together to make it possible to control the playback of sounds from a graphical user interface on a mobile phone to the sound playback and processing on the computer.

5.1 Overview

The graphical user interface resides on a mobile phone where the interaction for the musical improvisation takes place.

A computer is handling the playback and real time processing of sound-files.

One or several mobile phones connect via bluetooth wireless connection to the computer. The phones then send data to the computer when the user interacts with the graphical user interface for sound manipulation. The manipulation for the sound files changes in real time on the computer.

5.2 Interaction

The first prototype of the graphical user interface was a round shape on a canvas on the mobile phone screen that you could move around with the so called joystick button of the mobile phone. The x and y coordinates were used to control playback speed and length of the looped sound. This prototype interface was easy to use and very direct since one could control the available sound processing by only pushing up, down, left or right on the joystick.

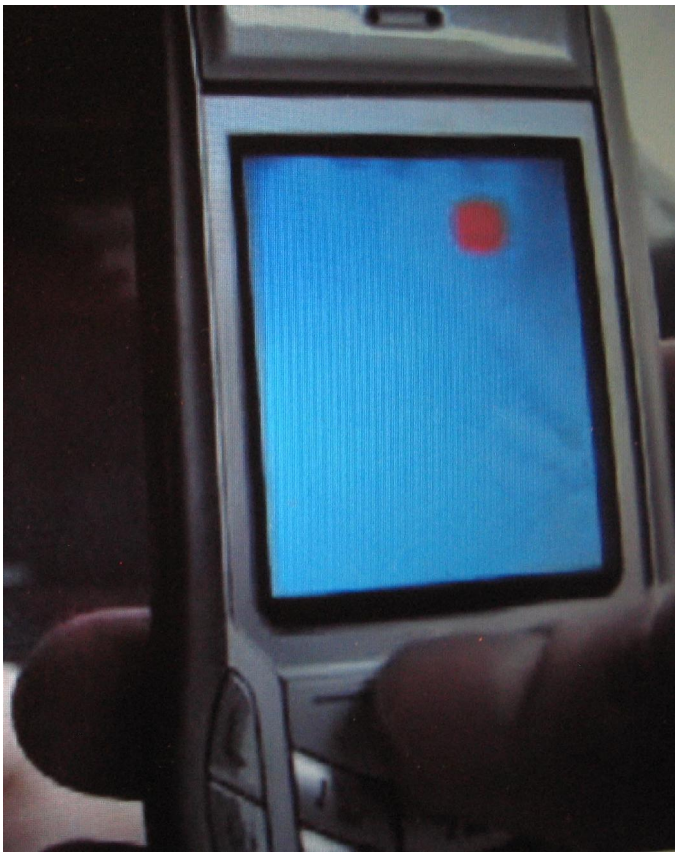


Illustration 7: The first prototype's graphical user interface

But soon we wanted to add the possibilities to change the volume, choose a new sound to play and stop or start the sound. We decided to use two horizontal sliders for the playback speed and length of the loop and three text buttons; start, stop and pick a new random sound. When you push the last text button you get a new sound from the collection for the performance randomly picked by the software. The new sound immediately starts to play as a loop when you push the button. The reason for making the choice random is because the soundfiles reside on the computer and control data is only sent from the phone to the computer and not vice versa in the prototype. A complementary function to choose a sound from a list instead of getting a random one might be developed in the future. The joystick button of the phone is used to choose between the sliders and buttons and also to interact with them.

This interface was developed quite rapidly without user testing. It came from sketches on how to map the functions of the system in a simple, understandable way where the only interaction is the mobile phone joystick. It has been proven to be easy to get into in just a few minutes by users during IMPROVe performances. We usuallyexplain how to use the interface to the first people we give the phones to, then they play and when they hand it over to the next person they explain how to use it. This method has worked good and we have got positive feedback about the interface most of the time. The fact that you hear the

changes directly when you interact with the interface could be considered as an important part of learning the interface in a very short time.

Basic sketches on other interfaces have been made but are not implemented since this interface has been working well and we have been focusing on developing the workshop concept. It is my intention to develop the interface in the future with more or other functions and also other ways to interact.

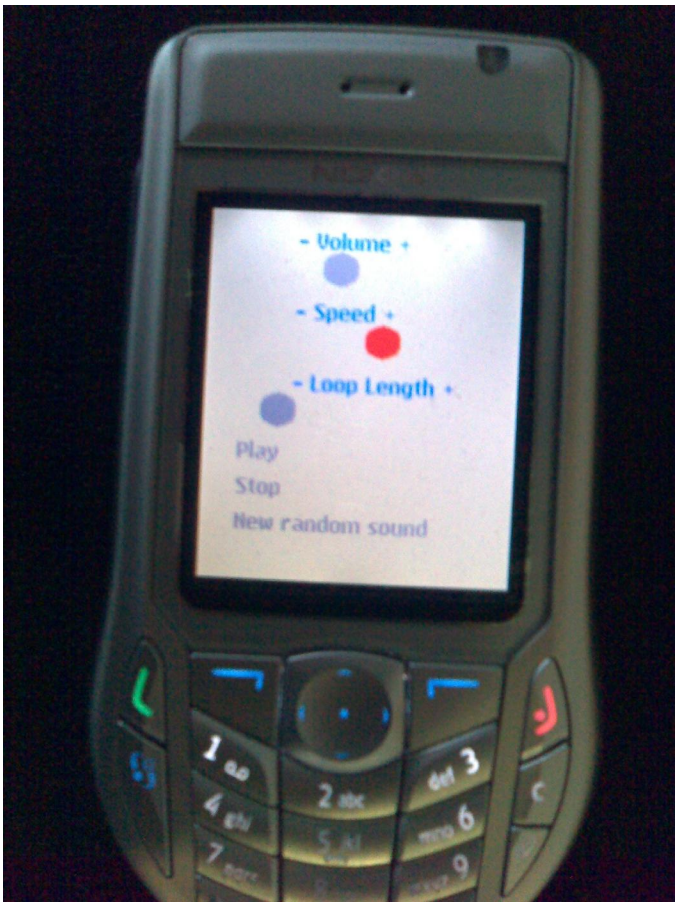


Illustration 8: The second prototype's graphical user interace

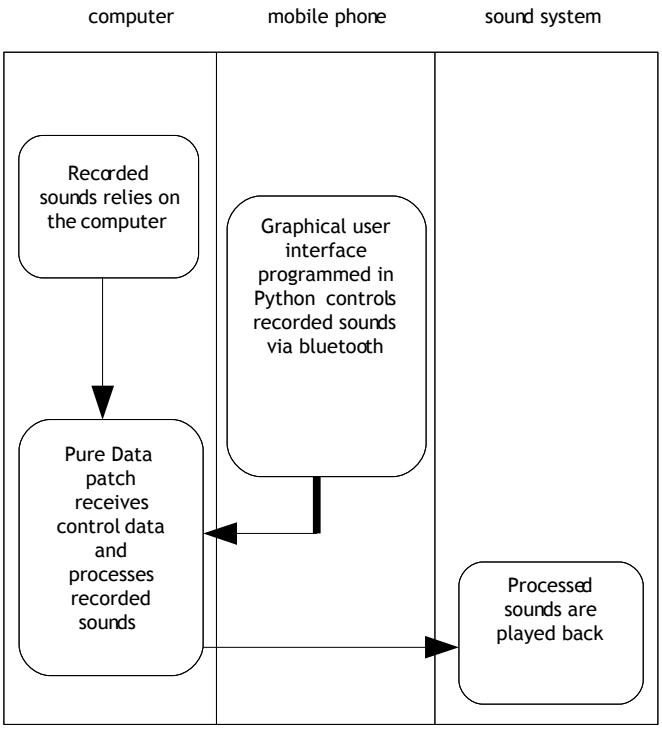
5.3 The mobile phone

The application on the mobile phone is developed in the programming script language Python for S60 2nd edition. It is not a standalone application and needs Python installed on the phone to run.

The application is connecting to serial ports to the computer via bluetooth. Each slider or button sends serial data to the computer as soon as interaction occurs. The serial data only goes from the phone to the computer, not the other way around since there is no need to

send serial data from the computer to the phone in the prototype. But if the function to choose the sound from the phone from a list of the sounds on the computer is going to be implemented there also needs to be serial data going from the computer to the phone.

The application on the phone only works as a "remote-control" to the application on the computer. The soundfiles are recorded on a sound recording devices and then put on the computer.



Drawing 1: System activity during improvisation

5.4 The computer

The IMPROVe application on the computer was developed in Pure Data which is a real-time graphical programming environment for audio, video, and graphical processing. The application is a patch in Pure Data and need to run in the Pure Data environment. Since Pure Data is available for most personal computer platforms, the IMPROVe patch can basically be run on any platform as long as you have a bluetooth connection and a sound card.

The patch takes data from the bluetooth serial ports to which one or more mobile phones are connected. The data from the phones is used to control the playback of one or more looped sounds. Each phone controls one sound. The sound-files resides on the hard disk

of the computer and are usually different for each IMPROVe session. The patch loads a random sound-file to one of it's buffers and plays it as a loop when the user pushes the new random sound button on the mobile phone application. The playback speed, loop length and volume changes in real time in the patch when the user interacts with the mobile phone software. The sound outputs from Pure Data to the sound card of the computer and can be connected to a sound system.

We have managed to connect up to five phones at the same time to one computer. It is however very unstable then so we have normally used three phones for one computer.

5.5 Distribution and platforms

Both Python for S60 phones and Pure Data are open source programming environments. We intentionally chose those two environments because we want IMPROVe to be open-source and available for free. We want to make it possible to download the IMPROVe software and easily install and set it up for use by anyone. But at it's current prototype status this is not possible. The IMPROVe software needs to be further developed.

When we develop it further we might also choose Java on the mobile phones instead of Python for S60. Java works on many more mobile phone platforms and IMPROVe can then be available for a larger group of users. The more people that have access to IMPROVe the better.

6 Future IMPROVements

The seed for IMPROVe came from an idea to develop software for mobile phones to control sound processing parameters in live performances. Also to be able to use the phone for sound or voice live sampling where the audience could contribute with sounds. This was primarily an idea intended for my own musical performance.

This idea came strongly from a software/technological framework related to my own musical practice. When I started to discuss it with Zeenath Hasan new thoughts arose which involved other practices and people. We developed the idea of using the phone as a sound recording device where the sounds later could be used for making music. From this point the ecology of the IMPROVe concept started to grow and is still growing with the practical situations it is used.

I have especially worked with the different modes of listening in this concept since this relates to my own trajectory of learning to listen through field recordings and music. The most rewarding parts in the work with IMPROVe has been to discuss and listen together with other people in the workshops and performances. Sometimes I have been thinking that we could leave the technology out and just talk about listening and sound. But at the same time I am aware that the technology used for IMPROVe is a reason for discussing sound and listening.

The future of IMPROVe will contain all former parts of this project; technological development, workshops, performances and conceptual development. But, as with all work within this project, conceptual and theoretical development will come out from the more practical moments. This is why I present more practical suggestions below.

The first thing that is needed to do is to make the software we currently use for IMPROVe stable, available and not too difficult to set up. After this I want to release the software for download and with open source code. Both mobile phone and computer platform issues will be considered to make it as accessible as possible.

Next issue is to develop IMPROVe software for my own, and other musicians, use as a live performance instrument. It would be very interesting to develop an environment that makes it easy to custom build an interface on the phone which is then sending midi data straight into any music software on a computer. This could then be used in many different ways and fulfill diverse needs. I see the potential of using the mobile phone with sensors and other forms of interaction that many electronic music practitioners for example use. I also want to develop my idea of using the mobile phone's recording function as a live

sampling instrument where recordings can be available straight away for live processing on a computer. This work will benefit for the whole project since these implementations could also be used in IMPROVe workshops and performances.

Other activities in the near future are more workshops and performances. I am looking forward to try out the concept with different age-groups as well as in different cultural contexts. The work with IMPROVe so far has been with a heterogeneous group of people. Mostly in media art or musical contexts in Europe. We are for example planning to have workshops with European teenagers and with different practitioners in India.

We also have plans to have workshops which focus on a specific site where anyone from there can participate. For example to work with city festivals or carnivals where inhabitants can explore the sonic layers of their city through IMPROVe.

Next technological step with IMPROVe is to look into the possibilities of working with all the IMPROVe activities on a mobile phone. First thing is to explore how to do proper soundscape recordings with the limited technology of a mobile phone. Hopefully this activity could get phone manufacturers interested, who I think easily could enhance the recording quality. Or it might interest field recording communities which we can work together with to find solutions to hack mobile devices to get better sound quality. I hope that IMPROVe is part of spreading an interest in mobile phones or other mobile devices as sound recording devices.

Another thing to explore is the possibility to playback and process the collected sounds on a mobile phone instead of a computer. Smart phones today have strong processing capabilities and it should not be a problem to do the simple sound processing of IMPROVe on those. But so far I have not seen much work done on realtime sound processing for mobile phones.

If these suggestions are implemented, IMPROVe could be much more widely used. The software could be downloaded and used immediately without the need for a computer and link between the phone and computer. Field recordings and editing could be done directly on a users phone which could then be used for an improvisation. The improvisation part could maybe even be done without a sound system since the players could use the built-in speakers on their phones instead. Or the improvisors could connect their phones to a portable sound system. The moment of improvisation could be much more spontaneous in this way since the improvisors could easy gather to play anywhere and anytime.

A different option on how to develop IMPROVe might be to actually not get too much into mobile phone software development. As it is now we only rely on mobile phones during the performance stage which as well could be done with other technologies. Computers, portable samplers or custom built devices could for example be used. Since

my experience that the most interesting part in the IMPROVe activities has been to discuss and listen to sound with workshop and performance participants the emphasis could instead be on conceptual development of these moments. Then for recording, editing and performing available means and devices could be used which would depend on the context and place. It would be interesting to explore diverse means for reproducing and making music with sounds within the IMPROVe framework.

Worth digesting is the technology of the mobile phone as a crucial factor for the success with this project. We have been consciously using the mobile phone as a "selling"-factor when applying for and presenting in festivals and exhibitions. We are aware of that mobile phone art projects are often fashionable in these contexts. Maybe IMPROVe will continue to be a partly technological project but with less emphasis on the software and devices in the future. I will continue to develop the software platform but it might go into other directions of use and IMPROVe might have a much richer ecology of technologies and activities in the future.

I will also continue my work related to listening and sound in and outside the IMPROVe framework. I especially want to explore more of the ideas behind the sound object and interpretation of sound which I briefly covered in this thesis. I am very curious to make more investigations into the rather new theoretical field of sound, art, music and technology.

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Included Audio

Included as audio-cd tracks on enclosed cd or online at:
http://www.riwid.net/improve/modes

Track – Name

01 - Pachinko

02 - Squidroses

03 - Bazaar Prayer

04 - Tokyo 10:56

05 - Hockey Rink

06 - Helsinki bar

07 - Lahälla beach

08 - In ice

09 - Kitchen Zürich

10 - Kitchen Zürich looped

11 - Police siren Zürich

12 - Pixelache 1

13 - Pixelache 2

14 - Pixelache 3

15 - Pixelache 4

16 - Pixelache 5

17 - Master of Arts 1

18 - Master of Arts 2

19 - Master of Arts 3

20 - Master of Arts 4

21 - Hearing Helsinki 1

22 - Hearing Helsinki 2

23 - Hearing Helsinki 3

24 - Hearing Helsinki 4

25 - Zurich 1

26 - Zurich 2

27 - Zurich 3

28 - Futuresonic Tullis

29 - Futuresonic 1

30 - Futuresonic 2

31 - Futuresonic 3

32 - Futuresonic 4

33 - Interferenze 1

34 - Interferenze 2

35 - Interferenze 3

Included Video

Included as data-files on enclosed cd or online at: http://www.riwid.net/improve/modes

Name (File name on cd)

Cabaret Voltaire (CabaretVoltaire.mov)

Master of Arts (MoA.mov)

Myymäla2 (Myymala2.mov)

Pixelache (Pixelache.mov)

Included code

The files for the IMPROVe prototype for mobile phone and computer are included on the enclosed cd. Although not so well commented and documented at this prototype stage. A better documented release will appear later on the above url.